PSY372H1S LEC0101: Human Memory

Winter 2022 // Thursdays from 3PM-6PM ET // UC 85 (Online until Jan 31, 2022)
Course Website: Quercus (https://q.utoronto.ca)

Instructor: Bryan Hong (bryan.hong@mail.utoronto.ca)
Office Hours Online by Appointment Only (https://calendly.com/bryan-hong/office-hours)

Teaching Assistant: Grace Gabriel (grace.gabriel@mail.utoronto.ca)

Prerequisite:
PSY201H1/ECO220Y1/EEB225H1/GGR270H1/POL222H1/SOC202H1/STA220H1/STA238H1/STA248H1/STA288H1/PSY201H5/STA215H5/STA220H5/PSYB07H3/STAB22H3/STAB23H3/STAB57H3, *and* PSY260H1/PSYB38H3 *or* PSY270H1/PSY270H5/PSYB57H3/COG250Y1
Exclusion: PSY372H5/PSYC53H3

Course Materials (required):
Radvansky, G.A. (2017). *Human Memory* (3rd Edition). New York, NY: Routledge.

- NOTE: This is available as a **FREE** eBook through the University of Toronto Libraries Course Reserves (https://ebookcentral-proquest-com.myaccess.library.utoronto.ca/lib/utoronto/detail.action?docID=4825146)

Additional assigned articles are listed below in the "What course materials do we need?" section – these will also be made available on Quercus.

Course Description

Our memories make us who we are, allowing us to direct our actions, communicate with others, and define ourselves. In addition to their practical function in our own everyday lives, memories permeate into much of our society, such as in educational (e.g. How do we learn best?) and judicial (e.g. How trustworthy is eyewitness testimony?) applications.

The goal of this course is to provide a solid foundation on our current understanding of how we learn and remember by covering a comprehensive research-based overview of the history, methodology, theories, and debates in the study of human memory.

IMPORTANT: Until further notice from the University of Toronto, **in-person learning is scheduled to be delayed until Monday, January 31, 2022** to limit the spread of the new COVID-19 variant of concern. This course will be fully online until then – lectures will be delivered asynchronously and be made available online on Quercus until it is safe to return to in-person lectures. When we return to in-person classes, lectures will be held on Thursdays between 3PM-6PM ET at UC 85. you will need access to a reliable computer and internet connection. More details on technical requirements and suggestions for online learning can be found at https://www.viceprovoststudents.utoronto.ca/covid-19/tech-requirements-online-learning/.

What will you learn?

By the end of this course, you should be able to:

1) Demonstrate knowledge about the scientific study of human memory, from both historical and current perspectives.
2) Apply your understanding of learning and memory to relevant situations in everyday life
3) Evaluate research in psychological science by learning to translate between data and theory while considering the limitations of the approach
4) Further develop your critical thinking and writing skills

Who is your instructor?

My name is **Bryan Hong** (bryan.hong@mail.utoronto.ca) and I am currently a PhD Candidate studying cognitive neuroscience at the University of Toronto, broadly studying the organizational structure of our memory. In addition, I've been working on developing solutions to help mitigate memory loss in aging. Feel free to ask me about my research!

In addition, **Grace Gabriel** (grace.gabriel@mail.utoronto.ca) will be the Teaching Assistant during the course. She will be supporting your learning during the course by helping to review course content, assessments, and studying advice.

Can I take this course?

You must have taken PSY201 (or equivalent) and PSY260H1/PSYB38H3 *or* PSY270H1/PSY270H5/PSYB57H3/COG250Y1 prior to the beginning of this course. You cannot take this class if you have taken PSY372H5/PSYC53H3.

It is *your responsibility* to ensure that you meet these criteria – if you lack the prerequisites, you will be removed from the course. No waivers will be granted. Please refer to the Psychology section in the University of Toronto Faculty of Arts and Science Calendar for more details.

What course materials do we need?

We will be using the following textbook for this course.

Radvansky, G.A. (2017). Human Memory (3rd Edition). New York, NY: Routledge.

An electronic version of this book is available for **FREE** through the University of Toronto Libraries Course Reserves (https://ebookcentral-proquest-com.myaccess.library.utoronto.ca/lib/utoronto/detail.action?docID=4825146)

We will also be going over the following assigned readings – all of the following articles can be found on Quercus.

Paper discussion 1: Episodic long-term memory
Karpicke, J.D., & Roediger, H.L. (2008). The critical importance of retrieval for learning. *Science, 319*(5865), 966-968.

Paper discussion 2: Autobiographical memory
Robin, J., Garzon, L., & Moscovitch, M. (2019) Spontaneous memory retrieval varies based on familiarity with a spatial context. *Cognition. 190*, 81–92.

Lecture 5: Tips for effective scientific writing
Gopen, G.D., & Swan, J.A. (1990). The science of scientific writing. *American Scientist, 78*(6), 550-558.

Lecture 7: New directions in memory research
Memory schemas

Gilboa, A., & Marlatte, H. (2017). Neurobiology of schemas and schema-mediated memory. *Trends in Cognitive Sciences, 21*(8), 618–631.

Tse, D., Langston, R.F., Kakeyama, M., Bethus, I., Spooner, P.A., Wood, E.R., ... Morris, R.G.M. (2007). Schemas and memory consolidation. *Science, 316*, 76–82.

Zeithamova, D., Dominick, A.L., & Preston, A.R. (2012). Hippocampal and ventral medial prefrontal activation during retrieval-mediated learning supports novel inference. *Neuron, 75*(1), 168–179.

Insights from single-cell recordings

Ekstrom, A.D., Kahana, M.J., Caplan, J.B., Fields, T.A., Isham, E.A., Newman, E.L., et al. (2003). Cellular networks underlying human spatial navigation. *Nature, 425*(6954), 184-188.

Quiroga, R.Q., Reddy, L., Kreiman, G., Koch, C., & Fried, I. (2005). Invariant visual representation by single neurons in the human brain. *Nature, 435*(7045), 1102-1107.

Episodic-like memory in animals

Eacott, M.J., & Norman, G. (2004). Integrated memory for object, place, and context in rats: a possible model of episodic-like memory? *Journal of Neuroscience, 24*(8), 1948-1953.

Templer, V.L., & Hampton, R.R. (2013). Episodic memory in nonhuman animals. *Current Biology, 23*, R801-R806.

How will this course be structured?

Lectures

Lectures will take place in person every Thursday between 3-6PM ET in UC85. Each lecture, we will introduce and discuss important concepts of the course and their real-world applications. I encourage you to take notes and ask any questions you have to clarify and expand on the material covered. You will be responsible for material covered during the lectures for the tests.

Until further notice from the University of Toronto, **lectures will be scheduled to be fully online until January 31, 2022**. Lectures will be made available on Quercus at the same time, Thursday at 3PM ET. Although we won't be able to have the same

experience as an in-person lecture, I still encourage you to take notes and write down any questions you have to clarify and expand on the material covered – I will be happy to answer any questions you have about content covered during the online lectures!

Textbook Readings

The textbook is used to supplement the content that is covered in class. Assigned chapters will review or expand on concepts we cover during the online lectures – there may also be important topics that are not covered in class. To get the most out of this class, I suggest completing all readings before the lecture. You will be responsible for assigned chapters for the tests.

Quercus

This course uses the University's learning management system, Quercus, to post information about the course. This includes posting readings and other materials required to complete class activities and course assignments, as well as sharing important announcements and updates. The site is dynamic and new information and resources will be posted regularly as we move through the term, so please make it a habit to log in to the site on a regular (even daily) basis.

To access the course website, go to the U of T Quercus log-in page at https://q.utoronto.ca. Once you have logged in to Quercus using your UTORid and password, you should see the link/'card' for our course (you may need to scroll through other cards to find this) – this link will allow you to enter our course area, view the latest announcements and access your course resources. There are Quercus help guides for students that you can access by clicking on the '?' icon in the left side column.

How will we communicate in this course?

I will try to facilitate as much communication as possible in this course – I encourage you to communicate whether you want to clarify concepts you might not understand, further explore topics you are interested in, have questions about the real-world application of the topics we cover, or want to re-clarify a grading decision.

Most general questions related to course content, policies, or assessments should first be posted to the Quercus Discussion Board – this will not only help yourself, but

many of your classmates will likely have the same question! You are encouraged to both ask and respond to questions on the Discussion Board. The TA and I will be monitoring the board as well.

For any issues regarding verification of illness, accessibility concerns, or other concerns specific to the course-structure, you can email me directly at bryan.hong@mail.utoronto.ca. You can also schedule office hours by appointment with me using the following website (https://calendly.com/bryan-hong/office-hours).

For all forms of communication, please use proper punctuation, spelling, grammar, complete sentences, etc. When emailing myself or the TA, please include "PSY372" in the subject line. We will try our best to respond to all emails within 2 business days – responses may be delayed during especially busy times, so I recommend going over the syllabus, website, and Discussion Board to see if your question has already been answered.

What will we be doing in this course?

Paper discussion – 10%

At the beginning of the term, you will be assigned to a paper discussion group that will meet either synchronously (via videoconference or in-person, if permitted) or asynchronously (via a Quercus Discussion Board set up for your group). Twice throughout the term you will read an article and discuss it in your small group. The outcome of this discussion will be a short, written assignment using the QALMRI method (worth 5% each). It will be submitted individually, but it should be informed by your group discussion.

Submission of your paper discussions will be done in 3 steps:

- Step 1 – Draft responses (worth 1 pt of overall 5 pt mark)
  You will individually read the paper and write a draft of your responses to the QALMRI questions. These will be marked for completion, within reason. You do not need to worry about writing full sentences at this point; the goal is for you to think critically about the assigned paper on your own, and make notes to yourself so you can contribute to the group discussion. If your responses indicate you have read the paper and thought critically about it, you will receive full points for this step.
- Step 2 – Group discussion

Bring your draft responses (as well as any questions you might have) to your group and discuss. All group members need to participate in the discussion. Be sure that you use this time to clear up any confusion you have about the paper. You should allocate about 1 hour for this if you are participating synchronously.

- Step 3 – Refine your responses (worth 4 pts of overall 5 pt mark)
  Submit an updated version of the assignment on Quercus that has your refined responses, using what you learned during your group discussion. The content of your assignments across group members may be similar, but you must write your own individual responses. In addition, your responses do not have to reflect the thoughts of your group members (e.g., if your group did not reach consensus or you have a different opinion). This assignment will be marked for both quality of content and writing style; although short, this is a formal writing assignment and so you should use complete sentences. A brief feedback survey will be required when assignments are submitted and those who did not participate in the group discussion will lose points.

Thought paper – 30%

The thought paper is focused on critically evaluating empirical research. The thought paper will be based on the topic of *memory schemas* (see articles in "What course materials do we need" for an introduction to the topic). You should focus on a recently published empirical article (i.e., not a review paper, chapter, or book) that was published in the last 3 years. For quality control, the primary article must be from a journal that is indexed on PubMed. You may select a study that was conducted in either humans or non-human animals. You should choose one article as the focus of your paper, but you should cite a minimum of 4 additional articles to back up any claims you make. There are no restrictions on these articles. For full marks, references will go beyond articles assigned for class. Your paper should be approximately 1500 words (6-8 pages; 8 pages max).

Your thought paper should include:

1. A summary of the primary article and how it relates to assigned topic. This should include a brief and concise description of the article. When describing a study, you should focus its rationale, aims, methods, results, and conclusions. No more than one full page is recommended.
2. A commentary or critique of the article that expresses your thoughts on the topic, not just a regurgitation of a given study's findings. This section is more open-ended and may involve: (i) relating the findings to other research

articles, (ii) linking it to a "real-life" situation and/or discussing of the scientific implications for the real world, (iii) describing what you found particularly interesting, (iv) stating whether you were convinced by the results, or (v) describing any limitations of the studies. It does not have to be a negative commentary: you may discuss strengths and/or weaknesses of the study. Finally, we expect you to propose a direction for future research, as this is an excellent way to situate the current study in the broader literature and demonstrate a deep understanding of the issues at stake.

Submission of your thought papers will be done in 4 steps:

- Step 1 – Paper approval (optional)
  You can submit your chosen article to confirm whether it meets the requirements for the assignment.
- Step 2 – Full draft (worth 5 pts of overall 30 pt mark)
  You will individually read your paper and write a full draft of your thought paper that includes all components of the assignment. These will be marked for completion, within reason – unlike the paper discussions, you must submit a complete draft to receive full marks. Outlines or notes will not receive full marks. If your responses indicate you have read the paper and thought critically about it, you will receive full points for this step.
- Step 3 – Peer review (worth 5 pts of overall 30 pt mark)
  You will then review one of your peer's submitted drafts, where you will be rating and providing comments for suggestions to improve their paper. Your peer review will be marked for content and collegiality. You will also receive a peer-reviewed version of your draft to refine your paper for the final submission.
- Step 4 – Final submission (worth 20 pts of overall 30 pt mark)
  Submit the final version of your thought paper that has been refined to consider the feedback you received in your peer review. Please use 12-point font with double spacing and 1-inch margins. All references should be listed using APA style. Please submit your file as a pdf using the following convention: *PSY372_2022W_<lastname>_paper.pdf*, where *<lastname>* should be replaced with your last name. The evaluation of this section of the thought paper will be based on your understanding of the issues covered in the article, your ability to articulate your thoughts on the article, your ability to synthesize the findings with other information, and the depth in which you evaluate the article. Prior to the thought paper deadline, there will be a lecture which includes a discussion of effective scientific writing.

Tests – 60%

There will be a total of 3 term tests (worth 20% each). Each of these tests will consist of multiple choice, short answer, and long answer questions. Tests are non-cumulative and will primarily cover material from the three lectures prior to the test. However, some questions will require integration of material covered across the course, so don't forget what you've learned! The questions are designed to not only test your knowledge of the course material, but also your ability to apply the concepts in novel situations.

Tests will be timed (i.e. you will have 3 hours to complete them), but you will have flexibility as to when you will begin them – specifically, they will be made available to start on Quercus for 24 hours starting from class time (Thursday at 3PM ET). These tests will be both open-book and untimed – this does not mean open-classmate, open-Google, etc. These are individual assignments and you are expected to follow the University of Toronto's Code of Behaviour on Academic Matters (http://www.governingcouncil.utoronto.ca/policies/behaveac.htm).

I will be available for contact via email from 3PM-6PM ET the day of the test for you to ask any clarification questions during the test – email response may not be as quick outside this time. If you want a space to write your test, tests can be taken in-person in our classroom (UC 85) during our regularly scheduled class time when it is safe to do so again – I will be there in-person to answer any clarification questions you may have.

What is the course schedule?

Week	Date	Topic	Readings	Assignment
1	Jan 13	• Course overview • Overview of history of memory research • Neuroscience of memory • QALMRI method	• Chapters 1-2	

2	Jan 20	• Methods in memory research • Sensory and short-term memory • Working memory	• Chapters 3-5 • Karpicke & Roediger (2008)	• Paper Discussion 1 (Karpicke & Roediger, 2008): Draft – due Jan 27 @ 3PM ET
3	Jan 27	• Episodic memory: Past and future	• Chapter 7	• Paper Discussion 1: Group Meeting – between Jan 27 and Feb 2 • Paper Discussion 1: Final Submission – due Feb 3 @ 3PM ET
4	Feb 3	**---- TERM TEST 1 ----**		
5	Feb 10	• Nondeclarative memory • Semantic memory	• Chapters 6 & 9 • Robin et al. (2019)	• Paper Discussion 2 (Robin et al, 2019): Draft – due Feb 17 @ 3PM ET
6	Feb 17	• Failures of memory • Autobiographical memory	• Chapters 8, 12, & 13	• Paper Discussion 2: Group Meeting – between Feb 17 and Feb 23 • Paper Discussion 2: Final Submission – due Feb 24 @ 3PM ET
	Feb 24	**---- READING WEEK ----**		
7	Mar 3	• Amnesia and memory disorders	• Chapter 8 • Hassabis et al. (2007)	• Thought Paper: Paper Approval (optional) – due Mar 10 @ 3PM ET

8	Mar 10	**---- TERM TEST 2 ----**		
9	Mar 17	• Critical topics in modern memory research	• See "*What course materials do we need?*" above	• Thought Paper: Draft – due Mar 24 @ 3PM ET
10	Mar 24	• Memory across the lifespan: Aging and development • Tips for effective scientific writing	• Chapters 16-17 • Gopen & Swan (1990)	• Thought Paper: Peer Review – due Mar 31 @ 3PM ET
11	Mar 31	• Memory and the law • Metamemory	• Chapters 14-15	• Thought Paper: Final Submission – due Apr 7 @ 3PM ET
12	Apr 7	**---- TERM TEST 3 ----**		

What are the course policies?

Academic Misconduct Policy

The University of Toronto takes its commitment to academic integrity very seriously – as such, there are serious consequences for instances of academic misconduct. Behaviours that constitute academic offences are outlined in the University of Toronto's Code of Behaviour on Academic Matters (http://www.governingcouncil.utoronto.ca/policies/behaveac.htm). This includes submitting the work of another (whether in part or in whole) as your own, possessing prohibited materials while writing tests, and providing or receiving assistance from another student unless explicitly permitted to do so. **Unless**

explicitly stated, all homework, writing, assessments, etc. submitted for a grade for this class must be done independently.

Any suspected cases of academic dishonesty will be investigated following the procedures outlined in the University of Toronto's Code of Behaviour on Academic Matters (http://www.governingcouncil.utoronto.ca/policies/behaveac.htm). If you have any questions or concerns regarding academic integrity, it is *your responsibility* to seek out the proper information either from the course instructor or other institutional resources (see www.utoronto.ca/academicintegrity/resourcesforstudents.html).

Missed Test Policy

There will be no make-up tests. If you miss a term test, please let me know as soon as reasonably possible and use the online self-declaration tool on ACORN under the Profile and Settings menu – a Verification of Illness is not currently required. In this case, your other assessments will be reweighted to make up the missing part of your grade.

If an absence extends beyond 14 consecutive days, or if you have a non-medical personal situation preventing you from completing your academic work, you should connect with your College Registrar. They can provide advice and assistance reaching out to instructors on your behalf. If you get a concussion, break your hand, or suffer some other acute injury, you should register with Accessibility Services as soon as possible.

Late and Extension Policy

Late assignments (not including tests) will be penalized by 5% per day, for up to 3 days (i.e. assignments that are submitted 25 hours past the deadline will receive a 10% late penalty).

Assignments will not be accepted after 3 days – you will receive an automatic 0 on these assignments. In the case of extraordinary circumstances, please email me with the appropriate details to set up a time to discuss these on a case-by-case basis.

Extensions will only be granted for rare circumstances and will only be accepted with the accompanying documentation. Please email me at least 72 hours before an assignment is due to request an extension.

Grading Dispute Policy

If you believe that your assignment was graded unfairly, please first wait for at least 24 hours following the return of the assignment before contacting us. Then contact the TA with details on where you think something was overlooked to set up a meeting to review your assignment. If you still feel as if your assignment was graded unfairly following this meeting, you can email me a short paragraph detailing your grade concern to request a regrade – grade disputes are not to be directed to your TA. Keep in mind that the regrade is *final* and your mark could go up, go down, or stay the same. This request must be made no later than two weeks from when the work was returned.

Audio Recording and Lecture Materials Usage Policy

Recordings are only for personal use and may not be shared with other students or distributed online unless permission is granted. Note that your participation may be recorded on audio/video and be made available to students in the course for viewing remotely and after each session.

Materials proved by me and the TA (including, but not limited to, the syllabus, lecture slides, handouts, recordings, etc.) are to be used by yourself and the other class members only. They are not to be posted in any public access forum or otherwise distributed without explicit permission from your instructor. Non-compliance with these terms violates an instructor's intellectual property rights and the Canadian Copyright Act. Students violating this agreement will be subject to disciplinary actions under the Code of Student Conduct.

University's Plagiarism Detection Tool

Normally, students will be required to submit their course essays to the University's plagiarism detection tool for a review of textual similarity and detection of possible plagiarism. In doing so, students will allow their essays to be included as source documents in the tool's reference database, where they will be used solely for the purpose of detecting plagiarism. The terms that apply to the University's use of this tool are described on the Centre for Teaching Support & Innovation website (https://uoft.me/pdt-faq).

Harassment and Discrimination

The University of Toronto is a diverse community and is committed to providing an environment free of any form of harassment, misconduct, or discrimination. In this course, I seek to foster a civil, respectful, and open-minded climate in which we can all work together to develop a better understanding of key questions and debates through meaningful dialogue. As such, I expect all involved with this course to refrain from behaviours that intimidate, humiliate, or demean persons or groups or that undermine their security or self-esteem based on traits related to race, religion, ancestry, place of origin, colour, ethnic origin, citizenship, creed, sex, sexual orientation, gender identity, gender expression, age, marital status, family status, disability, receipt of public assistance or record of offences.

Accessibility Services

Students with diverse learning styles and needs are welcome in this course. If you have an ongoing disability issue or accommodation need, you should register with Accessibility Services (http://accessibility.utoronto.ca) at the beginning of the academic year. Accessibility Services will then assess your medical situation, develop an accommodation plan with you, and support you in requesting accommodation for your course work.